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U.S. Application No.: 10/506,880

U.S. National Stage of:

International Application No.: PCT/EP03/02399

International Filing Date: 4 March 2003

For: PROTON CONDUCTING ELECTROLYTE MEMBRANE FOR USE IN HIGH TEMPERATURES AND THE USE THEREOF IN FUEL CELLS

Date: Nov. 18, 2004

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TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

Mail Stop PCT (DO/EO)
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed for filing in the U.S. Receiving Office is a copy of the English translation of the International Preliminary Examination Report (5 pages).

Please charge any deficiency or credit any overpayment in the fees that may be due in this matter to Deposit Account No. 08-0380. A copy of this letter is enclosed for accounting purposes.

Respectfully submitted,

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Translation

PATENT COOPERATION TREATY

PCT/EP2003/002399

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002/CVG003	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/002399	International filing date (*day/month/year*) 04 March 2003 (04.03.2003)	Priority date (*day/month/year*) 05 March 2002 (05.03.2002)
International Patent Classification (IPC) or national classification and IPC C08J 5/22, C08K 5/5317		
Applicant PEMEAS GmbH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
09 September 2003 (09.09.2003)	12 May 2004 (12.05.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.
PCT/EP2003/002399

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-51, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages 1-12, filed with the letter of 20 April 2004 (20.04.2004)

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIM[redacted]RY EXAMINATION REPORT

International [redacted]plication No.
PCT/EP 03/02399

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	3, 5	YES
	Claims	1, 2, 4, 6-12	NO
Inventive step (IS)	Claims		YES
	Claims	1-12	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

2. Citations and explanations

Cited documents

D1: US-A1-2001038937

D2: US-A-5643968

Novelty and inventive step (PCT Article 33(2) and (3))

Example 18 in D1 describes an electrolyte membrane for fuel cells (page 1, paragraph [0002]), obtainable by means of a method comprising the steps

(a) swelling of a membrane material in vinylphosphonic acid up to a swell level of 9 wt.%; and

(b) polymerization of the vinylphosphonic acid by UV radiation.

Thus D1 is prejudicial to the novelty of at least the subjects of claims 1, 2, 4 and 6 to 12.

The following should be noted with regard to the applicant's argument:

(i) The membrane in D1 consists of the claimed components. That membrane must therefore have the claimed intrinsic conductivity. If this is not the case, then (a) claim 1 lacks an essential feature that is responsible for the claimed intrinsic conductivity (PCT Article 6); and (b) it is not clear to a person skilled in the art from the

present application how a membrane disclosed in D1 and having the claimed components has to be modified in order to arrive at the claimed intrinsic conductivity (PCT Article 5). In this case, the application would not meet the requirements of PCT Articles 5 and 6;

(ii) The membrane in D1 is washed in water. As the applicant explained, the presence of water implies an intrinsic conductivity in the claimed range. Novelty over D1 therefore cannot be established also for this reason, irrespective of point (i).

D2 (column 1, lines 11-12 and column 3, lines 24-65) discloses a graft copolymer membrane containing

(A) a first polymer material; and

(B) grafted dimethylvinyl phosphonate.

The membrane is produced by

(a) the addition of the monomer to be grafted to the first polymer; and

(b) polymerization of the monomer added in step (a) (column 4, lines 61-65).

The method disclosed in D2 contains all the claimed steps. The product obtained must therefore be identical to the claimed product, i.e. in particular must have the claimed intrinsic conductivity. Furthermore, grafted chains penetrate the base polymer, and a graft copolymer can therefore basically also be regarded as an interpenetrating network. Thus the claimed product is identical to the product obtained in D2 also for this reason. Finally, it should be noted that D2 also discloses the coming into contact with aqueous hydrochloric acid (examples 1 and 2), and therefore, according to the applicant's argument, intrinsic conductivity in the

claimed range must be present.

The subject matter of claim 1 therefore lacks novelty over D2.

It is not clear from the application what problem is solved in a surprising way by the subject matter of the remaining claims, claims 3 and 5. Inventive step therefore cannot be recognized for these claims.